In the Claims

1-19 (canceled).

20 (currently amended). A method of identifying a candidate molecule for the treatment of schizophrenia, depression or bipolar disorder, said method comprising:

(a) contacting a D-amino acid oxidase (DAO) polypeptide comprising SEQ ID NO: 7~~DAO or DDO polypeptide~~ or a ~~biologically active~~ fragment thereof that has DAO enzymatic activity with a test compound; and

(b) determining whether said compound

(i) selectively reduces the enzymatic activity of said polypeptide or fragment thereof; or

(ii) selectively binds said polypeptide or fragment thereof;

wherein a test compound that selectively reduces the enzymatic activity of said polypeptide or fragment thereof or selectively binds to said polypeptide or fragment thereof is identified as a candidate molecule for the treatment of schizophrenia, depression or bipolar disorder.

21 (currently amended). A method of screening for antagonists of a DAO ~~or a DDO~~ polypeptide, comprising the steps of:

(a) contacting a test compound with a DAO ~~or DDO~~ polypeptide comprising SEQ ID NO: 7; ~~selected from the group consisting of;~~

~~(i) a polypeptide comprising a polypeptide encoded by a nucleic acid sequence selected from the group consisting of SEQ ID NOS: 2 to 6, 19 and 20;~~

~~(ii) a polypeptide comprising a polypeptide sequence selected from the group consisting of SEQ ID NOS: 7 to 10, 21 and 22;~~

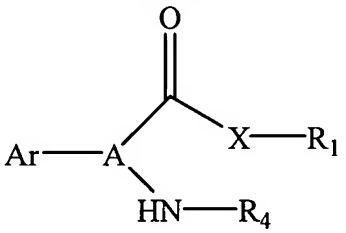
(b) detecting the level of DAO activity; and

(c) comparing the activity to the activity of a control test without the test compound, whereby a decrease in the level of DAO~~the DAO or DDO~~ activity over the control indicates that the test compound is an antagonist of DAO ~~or DDO~~.

22-29 (canceled).

30 (previously presented). The method according to claim 20 or 21, wherein said test compound is:

(1) a compound represented by the structure:



or pharmaceutically acceptable salts thereof, wherein:

a) A is alkyl; branched chain alkyl; or cycloalkyl, any of which can be substituted with C_1-C_6 alkyl, halo, hydroxyl or amino;

b) X is O or N;

c) Ar is an aromatic mono-, bi- or tricyclic fused heterocyclic ring, wherein the ring is either unsubstituted or substituted in one to five position(s) with hydrogen, halogen, hydroxyl, -CN, COR_2, --$CONR_2R_3$, --$S(O)_nR_2$, --$OPO(OR_2)OR_3$, --$PO(OR_3)R_3$, --$OC(O)NR_2R_3$, --$COOR_2$, --$CONR_2R_3$, --SO_3H, --NR_2R_3, --NR_2 COR_3, --NR_3 $COOR_3$, --SO_2 NR_2 R_3, --$N(R_2)$ SO_2 R_3, --NR_2 $CONR_2$ R_2, --SO_2NHCOR_2, --$CONHSO_2$ R_2, --SO_2NHCN, --OR_1, C_1-C_6 straight or branched chain alkyl or alkenyl, or C_1-C_6 branched or straight chain alkyl or alkenyl which is substituted with one or more, halogen, hydroxyl, amino, carboxy, carboxamide, nitrile, nitro, alkoxy, trifluoromethyl, sulfur, sulfonate, phosphonate, phosphate, Ar^1, N_3 or a combination thereof and wherein the heterocyclic ring contains 1-6

heteroatom(s) selected from the group consisting of O, N, S, and a combination thereof;

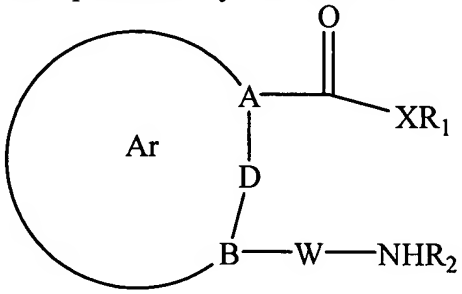
d) R_4 is H, alkyl, Ar^1, O, or a substituted alkyl;

e) R^1 is C_1-C_6 alkyl, Ar^1, C_1-C_4 alkoxycarbonylmethyl, or a substituted alkyl;

f) R_2 and R_3 are each independently, hydrogen, C_1-C_6 straight or branched chain alkyl or alkenyl, or C_1-C_6 branched or straight chain alkyl or alkenyl which is substituted with one or more, halogen, hydroxyl, amino, carboxy, carboxamide, nitrile, nitro, alkoxy, trifluoromethyl, sulfur, sulfonate, phosphonate, phosphate, Ar^1, or N_3; and

g) Ar^1 is a mono-, bi- or tricyclic, carbo- or heterocyclic ring, wherein the ring is either unsubstituted or substituted in one to three position(s) with halo, hydroxyl, nitro, trifluoromethyl, C_1-C_6 straight or branched chain alkyl or aklenyl, C_1-C_4 alkoxy, C_1-C_4 alkenyloxy, phenoxy, benzyloxy, amino, or a combination thereof; wherein the individual ring sizes are 3-7 members; and wherein the heterocyclic ring contains 1-6 heteroatom(s) selected from the group consisting of O, N, S, and a combination thereof;

(2) a compound represented by the structure:



or pharmaceutically acceptable salts thereof, wherein:

a) A and B are carbon or nitrogen and D has 0-2 members that are carbon or nitrogen;

b) W is $(CH_2)_n$ or a branched chain alkyl, wherein n is 0-4 and when n=0 NHR_2 is covalently bound to B;

c) X is O or N;

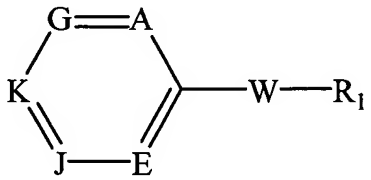
d) R_2 is H, alkyl, Ar^1, or O substituted alkyl;

e) R^1 is C_1-C_6 alkyl, Ar^1, C_1-C_4 alkoxycarbonylmethyl, or substituted alkyl;

f) Ar is an aromatic mono-, bi- or tricyclic fused heterocyclic ring, wherein the ring is either unsubstituted or substituted in one to six position(s) with halo, hydroxyl, nitro, trifluoromethyl, C_1-C_6 straight or branched chain alkyl or alkenyl, C_1-C_4 alkoxy, C_1-C_4 alkenyloxy, phenoxy, benzyloxy, amino, C_3-C_6 cycloalkyl or a combination thereof; wherein the individual ring sizes are 5-6 members; and wherein the heterocyclic ring contains 1-6 heteroatom(s) selected from the group consisting of O, N, S, and a combination thereof; and

g) Ar^1 is a mono-, bi- or tricyclic, carbo- or heterocyclic ring, wherein the ring is either unsubstituted or substituted in one to three position(s) with halo, hydroxyl, nitro, trifluoromethyl, C_1-C_6 straight or branched chain alkyl or alkenyl, C_1-C_4 alkoxy, C_1-C_4 alkenyloxy, phenoxy, benzyloxy, amino, C_3-C_6 cycloalkyl or a combination thereof; wherein the individual ring sizes are 3-7 members; and wherein the heterocyclic ring contains 1-6 heteroatom(s) selected from the group consisting of O, N, S, and a combination thereof;

(3) a compound represented by the structure:



or pharmaceutically acceptable salts thereof, wherein:

a) A, G, K, J, E are members of a six membered carbon or heterocyclic aromatic ring, wherein the heterocyclic ring contains 1-6 atom(s) selected from the group consisting of C, N and a combination thereof:

b) A, G, K, J, E may each independently be unsubstituted or substituted with hydrogen, halogen, hydroxyl, -CN, COR_2, --$CONR_2R_3$, --$S(O)_nR_2$, --$OPO(OR_2)OR_3$, --$PO(OR_3)R_3$, --$OC(O)NR_2R_3$, --$COOR_2$, --$CONR_2R_3$, --

SO_3H, --NR_2R_3, --NR_2COR_3, --NR_3COOR_3, --$SO_2NR_2R_3$, --$N(R_2)SO_2R_3$, --$NR_2CONR_2R_2$, --SO_2NHCOR_2, --$CONHSO_2R_2$, --SO_2NHCN, --OR_1, C_1-C_6 straight or branched chain alkyl, C_1-C_6 straight or branched chain alkenyl, or C_1-C_6 branched or straight chain alkyl or alkenyl which is substituted with one or more, halogen, hydroxyl, amino, carboxy, carboxamide, nitrile, nitro, alkoxy, trifluoromethyl, sulfur, sulfonate, phosphonate, phosphate, Ar^1, or N_3;

c) R_1 is CN, COR_2, --$CONR_2R_3$, --$S(O)_nR_2$, --$OPO(OR_2)OR_3$, --$PO(OR_3)R_3$, --$OC(O)NR_2R_3$, --$COOR_2$, --$CONR_2R_3$, --SO_3H, --NR_2R_3, --NR_2COR_3, --NR_3COOR_3, --$SO_2NR_2R_3$, --$N(R_2)SO_2R_3$, --$NR_2CONR_2R_2$, --SO_2NHCOR_2, --$CONHSO_2R_2$, --SO_2NHCN, SCN, $COCO_2H$, C_1-C_6 straight or branched chain alkyl or alkenyl, or C_1-C_6 branched or straight chain alkyl or alkenyl which is substituted with one or more halogen, hydroxyl, amino, carboxy, carboxamide, nitrile, nitro, alkoxy, trifluoromethyl, sulfur, sulfonate, phosphonate, phosphate, Ar^1, or N_3;

d) W is N, $(CH_2)_x$, or $-NCH_2$;

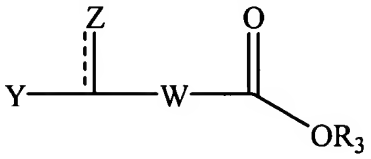
e) x=0-4;

f) n=0-2;

g) R_2 and R_3 are each, independently, hydrogen, C_1-C_6 straight or branched chain alkyl or alkenyl, or C_1-C_6 branched or straight chain alkyl or alkenyl which is substituted with one or more halogen, hydroxyl, amino, carboxy, carboxamide, nitrile, nitro, alkoxy, trifluoromethyl, sulfur, sulfonate, phosphonate, phosphate, Ar^1, or N_3; and

h) Ar^1 is a mono-, bi- or tricyclic, carbo- or heterocyclic ring, wherein the ring is either unsubstituted or substituted in one to three position(s) with halo, hydroxyl, nitro, trifluoromethyl, C_1-C_6 straight or branched chain alkyl or alkenyl, C_1-C_4 alkoxy, C_1-C_4 alkenyloxy, phenoxy, benzyloxy, amino, or a combination thereof; wherein the individual ring sizes are 5-6 members; and wherein the heterocyclic ring contains 1-6 heteroatom(s) selected from the group consisting of O, N, S, and a combination thereof;

(4) a compound represented by the structure:



or pharmaceutically acceptable salts thereof, wherein:

a) $W=(CH_2)_n$;

b) n=0-5;

c) Z is oxygen or hydroxyl;

d) Y= H, Ar^1, R_4 $(CH_2)_x$, $R_1S(CH_2)_x$--, $R_1SO(CH_2)_x$--, $R_1SO_2(CH_2)_x$--, $R_1SO_3(CH_2)_x$--, $HNR_1SO_2(CH_2)_x$--, $R_1R_2N(CH_2)_x$, $R_1O(CH_2)$--, CF_3, or OH;

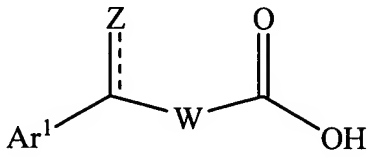
e) x=0-6;

f) R_1, R_2 and R_3 are each independently hydrogen, C_1-C_6 straight or branched chain alkyl or C_1-C_6 branched or straight chain alkyl substituted with one or more halogen, hydroxyl, amino, carboxy, carboxamide, nitrile, nitro, alkoxy, trifluoromethyl, sulfur, sulfonate, phosphonate, phosphate, or Ar^1;

g) R_4 is a halogen, CN, N_3, C_1-C_6 straight or branched chain alkyl or C_1-C_6 branched or straight chain alkyl substituted with one or more halogen, hydroxyl, nitro, alkoxy, trifluoromethyl, sulfonate, phosphonate, phosphate, Ar^1, --COR_1, --$COOR_1$, $CONR_1R_2$, CN, --NR_1, --NR_1R_2,-- SR_1, --SO_2NHCN, or N_3; and

h) Ar^1 is a mono-, bi- or tricyclic, carbo- or heterocyclic ring, wherein the ring is either unsubstituted or substituted in one to three position(s) with halo, hydroxyl, nitro, trifluoromethyl, C_1-C_6 straight or branched chain alkyl or alkenyl, C_1-C_4 alkoxy, C_1-C_4 alkenyloxy, phenoxy, benzyloxy, amino, or a combination thereof; wherein the individual ring sizes are 5-6 members; and wherein the heterocyclic ring contains 1-6 heteroatom(s) selected from the group consisting of O, N, S, and a combination thereof;

(5) a compound represented by the structure:



or pharmaceutically acceptable salts thereof, wherein:

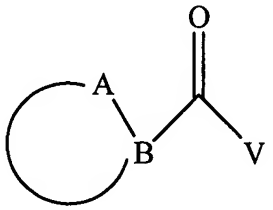
a) Y is Ar^1;

b) Z is a carbonyl or hydroxyl;

c) W is $(CH_2)_n$ wherein n = 0, 1, or 2; and

d) Ar^1 is a mono-, bi- or tricyclic, carbo- or heterocyclic ring, wherein the ring is either unsubstituted or substituted in one to three position(s) with halo, hydroxyl, nitro, trifluoromethyl, C_1-C_6 straight or branched chain alkyl or alkenyl, C_1-C_4 alkoxy, C_1-C_4 alkenyloxy, phenoxy, benzyloxy, amino, or a combination thereof; wherein the individual ring sizes are 5-6 members; and wherein the heterocyclic ring contains 1-6 heteroatom(s) selected from the group consisting of O, N, S, and a combination thereof;

(6) a compound represented by the structure:



or pharmaceutically acceptable salts thereof, wherein:

a) A and B taken together, form a 5-8 membered saturated or partially unsaturated heterocyclic ring containing at least one additional O, S, SO, SO_2, NH, or NR^1 heteroatom in any chemically stable oxidation state;

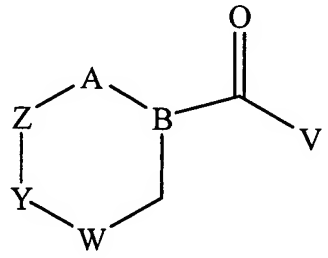
b) V is O, OR_1, NR_2, NR_1R_2, CHR_1R_2, CH_2R_3, CHR_3R_4, or CH_2N_3;

c) R_1 and R_2 are independently hydrogen, C_1- C_6 straight or branched chain alkyl or C_1-C_6 branched or straight chain alkyl substituted with one or more halogen, hydroxyl, amino, carboxy, carboxamide, nitro, alkoxy, trifluoromethyl, sulfur, sulfonate, phosphonate, or Ar^1;

d) R_3 and R_4 are either halogen, C_1- C_6 straight or branched chain alkyl or C_1-C_6 branched or straight chain alkyl substituted with one or more hydroxyl, amino, carboxy, carboxamide, nitro, alkoxy, trifluoromethyl, sulfur, sulfonate, phosphonate, Ar^1, --$OC(O)R_1$, --$COOR_1$, $CONR_1R_2$, CN, NR_1, NR_1R_2, SR_1, SO_2NHCN, or N_3; and

e) Ar^1 is a mono-, bi- or tricyclic, carbo- or heterocyclic ring, wherein the ring is either unsubstituted or substituted in one to three position(s) with halo, hydroxyl, nitro, trifluoromethyl, C_1-C_6 straight or branched chain alkyl or alkenyl, C_1-C_4 alkoxy, C_1-C_4 alkenyloxy, phenoxy, benzyloxy, amino, or a combination thereof; wherein the individual ring sizes are 5-6 members; and wherein the heterocyclic ring contains 1-6 heteroatom(s) selected from the group consisting of O, N, S, and a combination thereof;

(7) a compound represented by the structure:



or pharmaceutically acceptable salts thereof, wherein:

a) W-Y-Z-A-B comprise a six membered saturated or partially saturated carbocyclic or heterocyclic ring, wherein the heterocyclic ring contains heteroatom(s) selected from the group consisting of -O, N, S, and any combination thereof:

b) B is either C, CH, or N;

c) A, W, Y, Z are each independently CH_2, CHR_3, CR_3R_4, O, S, SO, SO_2, NH, NR_1, NR_1R_2, or C=O;

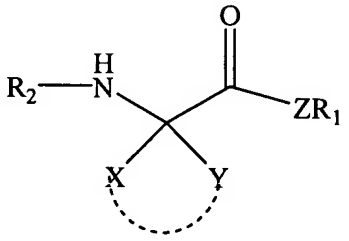
d) V is O, OR_1, NR_2, NR_1R_2, CHR_1R_2, CH_2R_3, CHR_3R_3 or CH_2N_3;

e) R_1 and R_2 are independently hydrogen, C_1-C_6 straight or branched chain alkyl or C_1-C_6 branched or straight chain alkyl substituted with one or more halogen, hydroxyl, amino, carboxy, carboxamide, nitrile, nitro, alkoxy, trifluoromethyl, sulfur, sulfonate, phosphonate, phosphate, or Ar^1;

f) R_3 and R_4 are each independently halogen, --$OC(O)R_1$, --$COOR_1$, --$CONR_1R_2$, CN, --NR_1, --NR_1R_2, --SR_1, --SO_2NHCN, N_3, C_1-C_6 straight or branched chain alkyl or C_1-C_6 branched or straight chain alkyl substituted with one or more halogen, hydroxyl, nitro, alkoxy, trifluoromethyl, sulfonate, phosphonate, Ar^1, --$OC(O)R_1$, --$COOR_1$,-- $CONR_1R_2$, CN, --NR_1, --NR_1R_2, --SR_1, --SO_2NHCN, or N_3; and

g) Ar^1 is a mono-, bi- or tricyclic, carbo- or heterocyclic ring, wherein the ring is either unsubstituted or substituted in one to three position(s) with halo, hydroxyl, nitro, trifluoromethyl, C_1-C_6 straight or branched chain alkyl or alkenyl, C_1-C_4 alkoxy, C_1-C_4 alkenyloxy, phenoxy, benzyloxy, amino, or a combination thereof; wherein the individual ring sizes are 5-6 members; and wherein the heterocyclic ring contains 1-6 heteroatom(s) selected from the group consisting of O, N, S, and any combination thereof;

(8) a compound represented by the structure:



or pharmaceutically acceptable salts thereof, wherein:

a) Z is O or NH;

b) R^1 is C_1-C_6 alkyl, Ar^1, or C_1-C_4 alkoxycarbonylmethyl;

c) X, Y, independently of one another, are H, Ar^1, C_1-C_6 alkyl, C_2-C_6 alkenyl, C_1-C_6 haloalkyl, or halogen,

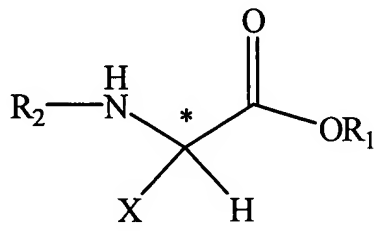
wherein said C_1-C_6 alkyl is optionally interrupted or substituted by heteroatoms selected from the group consisting of N, P, O, S and Si and said heteroatoms are optionally substituted by C_1-C_3 alkyl once or several times and

when X and Y are each carbon, they may be covalently joined to form a saturated or partially unsaturated cyclic compound of 3-8 members consisting independently of C, N, O, and S, further wherein ring members may themselves be unsubstituted or substituted with halo, hydroxyl, carboxy, nitro, trifluoromethyl, C_1-C_6 straight or branched chain alkyl or alkenyl, C_1-C_4 alkoxy, C_1-C_4 alkenyloxy, phenoxy, benzyloxy, amino, substituted alkyl, Ar^1, or a combination thereof;

d) R_2 is H, alkyl, Ar^1, or O substituted alkyl; and

e) Ar^1 is a mono-, bi- or tricyclic, carbo- or heterocyclic ring, wherein the ring is either unsubstituted or substituted in one to three position(s) with halo, hydroxyl, nitro, trifluoromethyl, C_1-C_6 straight or branched chain alkyl or alkenyl, C_1-C_4 alkoxy, C_1-C_4 alkenyloxy, phenoxy, benzyloxy, amino, or a combination thereof; wherein the individual ring sizes are 3-7 members; and wherein the heterocyclic ring contains 1-6 heteroatom(s) selected from the group consisting of O, N, S, and any combination thereof;

(9) a compound represented by the structure:



or pharmaceutically acceptable salts thereof, wherein:

a) * = asymmetric center;

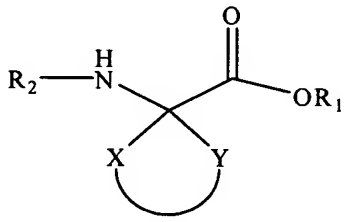
b) R^1= C_1-C_6 alkyl, Ar^1, or C_1-C_4 alkoxycarbonylmethyl;

c) X is H, C_1-C_6 alkyl, C_2-C_6 alkenyl, C_1-C_6 haloalkyl, halogen, or Ar^1, wherein said C_1-C_6 alkyl is optionally interrupted or substituted by heteroatoms selected from the group consisting of N, P, O, S and Si and said heteroatoms are optionally substituted by C_1-C_3 alkyl once or several times;

d) R_2 is H, alkyl, Ar^1, or O substituted alkyl;

e) Ar^1 is a mono-, bi- or tricyclic, carbo- or heterocyclic ring, wherein the ring is either unsubstituted or substituted in one to three position(s) with halo, hydroxyl, nitro, trifluoromethyl, C_1-C_6 straight or branched chain alkyl or alkenyl, C_1-C_4 alkoxy, C_1-C_4 alkenyloxy, phenoxy, benzyloxy, amino, or a combination thereof; wherein the individual ring sizes are 3-7 members; and wherein the heterocyclic ring contains 1-6 heteroatom(s) selected from the group consisting of O, N, S, and any combination thereof;

(10) a compound represented by the structure:



or pharmaceutically acceptable salts thereof, wherein:

a) X and Y are each carbon;

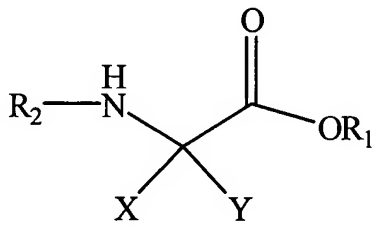
b) X and Y are connected by a saturated or partially saturated ring of 3-8 carbons and such a ring may itself be substituted in one to five position(s) with halo, hydroxyl, carboxy, amino, nitro, cyano, trifluoromethyl, C_1-C_6 straight or branched chain alkyl or alkenyl, C_1-C_4 alkoxy, C_1-C_4 alkenyloxy, or substituted alkyl groups;

c) R^1= C_1-C_6 alkyl, Ar^1, or C_1-C_4 alkoxycarbonylmethyl;

d) R_2 is H, alkyl, Ar^1, or O substituted alkyl; and

e) Ar^1 is a mono-, bi- or tricyclic, carbo- or heterocyclic ring, wherein the ring is either unsubstituted or substituted in one to three position(s) with halo, hydroxyl, nitro, trifluoromethyl, C_1-C_6 straight or branched chain alkyl or alkenyl, C_1-C_4 alkoxy, C_1-C_4 alkenyloxy, phenoxy, benzyloxy, amino, or a combination thereof; wherein the individual ring sizes are 3-7 members; and wherein the heterocyclic ring contains 1-6 heteroatom(s) selected from the group consisting of O, N, S, and any combination thereof;

(11) a compound represented by the structure:



or pharmaceutically acceptable salts thereof, wherein:

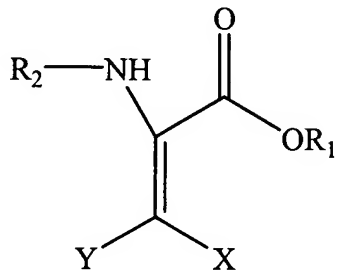
a) X, Y, independently of one another, are H, Ar^1, C_1-C_6 alkyl, C_2-C_6 alkenyl, C_1-C_6 haloalkyl, or halogen, wherein said C_1-C_6 alkyl is optionally interrupted or substituted by heteroatoms selected from the group consisting of N, P, O, S and Si and said heteroatoms are optionally substituted by C_1-C_3 alkyl once or several times;

b) R_2 is H, alkyl, Ar^1, or O substituted alkyl; and

c) Ar^1 is a mono-, bi- or tricyclic, carbo- or heterocyclic ring, wherein the ring is either unsubstituted or substituted in one to three position(s) with halo, hydroxyl, nitro, trifluoromethyl, C_1-C_6 straight or branched chain alkyl or alkenyl, C_1-C_4 alkoxy, C_1-C_4 alkenyloxy, phenoxy, benzyloxy, amino, or a combination thereof; wherein the individual ring sizes are 3-7 members; and

wherein the heterocyclic ring contains 1-6 heteroatom(s) selected from the group consisting of O, N, S, and any combination thereof; or

(12) a compound represented by the structure:



or pharmaceutically acceptable salts thereof, wherein:

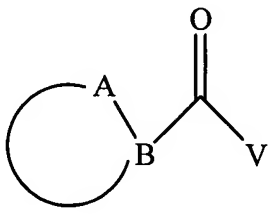
a) R^1= C_1-C_6 alkyl, Ar^1, or C_1-C_4 alkoxycarbonylmethyl;

b) R_2 is H, alkyl, Ar^1, or O substituted alkyl;

c) Y is H, Ar^1, C_1-C_6 alkyl, C_2-C_6 alkenyl, C_1-C_6 haloalkyl, or halogen, wherein said C_1-C_6 alkyl is optionally interrupted or substituted by heteroatoms selected from the group consisting of N, P, O, S and Si and said heteroatoms are optionally substituted by C_1-C_3 alkyl once or several times; and

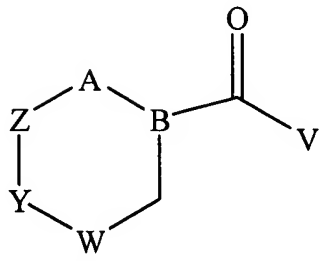
d) X is alkyl or phenyl.

31 (Previously Presented). The method according to claim 30, wherein said compound represented by the structure:



is cystathionine ketimine or cyclothionine.

32 (Previously Presented). The method according to claim 30, wherein said compound represented by the structure:



is selected from the group consisting of: aminoethylcysteine-ketimine (2H-1,4-thiazine-5,6-dihydro-3-carboxylic acid), thiomorpholine-2-carboxylic acid, lanthionine ketimine, and 1,4-thiomorpholine-3, 5-dicarboxylic acid.

33-43 (canceled).

44 (new). The method according to claim 20, wherein said method determines whether said compound selectively reduces the enzymatic activity of said polypeptide.

45 (new). The method according to claim 20, wherein said method determines whether said compound selectively binds said polypeptide.